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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/702,156	11/05/2003	David L. Adler	10011.001210 (P0980)	7297

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EXAMINER	
QUASH, ANTHONY G	

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 02/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/702,156	ADLER, DAVID L.	
	Examiner	Art Unit	
	Anthony Quash	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9,11-15,18-23 and 27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,11-15,18-23 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Claims 6-8,10,16-17,24-26 have been canceled by applicants' amendment, filed 8/8/05.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6,8-15,18-23,27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yin [6,844,550] in view of the "Multiple Electron-Beam Lithography" by Chang et el. With respect to independent claims 1,4,9,15, and 20, Yin [6,844,550] teaches a method/apparatus for inspecting portions of a substrate comprising, generating incident electron beams, directing N incident beams through N separators (1196, fig. 11), focusing N beams onto N areas of the substrate, directing electrons emitted from the N areas through the N beam separators in a second direction so as to separate the emitted electrons from the incident beams, detecting the emitted electrons using N detectors in a parallel manner; and translation of the substrate in a path that covers approximately 1/N of the portion of the substrate to be inspected. Yin [6,844,550] also teaches there being a plurality of columns, plurality of detectors,

plurality of processing sub-systems, and the plurality of incident beams each impinging on a different area, and detecting and processing in parallel (col. 3 lines 1-25, col. 4 lines 65-67) the electrons emitted from the different areas. See Yin [6,844,550] abstract, figs. 1-6,10-11,13,15, col. 1 lines 30-40, col. 2 line 65 – col. 3 line 25, column 4, col. 5 lines 1-40, col. 6 lines 1-10,34-67, col. 7 line 15-20, col. 9 lines 5-15,30-40, col. 10 lines 35-62, and col. 13 lines 1-15. However, Yin [6,844,550] does not explicitly state the beams being multi-pixel beams. The "Multiple Electron-Beam Lithography" by Chang et el, does teach state the beams being multi-pixel beams. See The "Multiple Electron-Beam Lithography" by Chang et el, abstract, first and second paragraphs on page 1, paragraph 2-3,5 on page 3 and paragraphs 1-3 on page 4. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have incident beam from the multiple columns be multi-pixel beams in order to allow the detection of smaller sized defects, and reduce the time need to inspect a substrate for defects.

As per claims 2-3, Yin [6,844,550] teaches the portion of the substrate being inspected comprises all integrated circuit dies on a wafer, and the portion of the substrate to be inspected comprises a fraction of dies on a wafer. See Yin [6,844,550] abstract, fig. 3, and col. 5 lines 1-40.

As per claim 5, Yin [6,844,550] infers a translation mechanism for translating the wafer under the plurality of incident beams such that the plurality of regions are scanned across the wafer. This is made evident when Yin [6,844,550] states, "... a wafer stage with six degrees of freedom of movement .... the stage is slowly scanned in the Y-

direction. The wafer stage motion is called a serpentine motion (back-and-forth, imaging in both scan directions), ..." See Yin [6,844,550] fig. 3, figs. 15-16, col. 3 lines 1-5, col. 6 lines 50-67. Therefore it is the examiner's view that Yin [6,844,550] does indeed implicitly teach a translation mechanism for translating the wafer under the plurality of incident beams such that the plurality of regions are scanned across the wafer.

As per claim 11, Yin [6,844,550] teaches translation of substrate in a path such that the plurality of incident beams are scanned across the surface of the substrate. See Yin [6,844,550] fig. 3, figs. 15-16, col. 3 lines 1-5, and col. 6 lines 50-67.

As per claim 12, Yin [6,844,550] teaches the plurality of incident beams comprises N incident beams, and wherein an inspected area during the translation comprises approximately N times an area covered by the translation path. See Yin [6,844,550] fig. 3, col. 6 lines 35-67.

As per claims 13-14, Yin [6,844,550] in view of the "Multiple Electron-Beam Lithography" by Chang et el, teach all aspects of the claims except for explicitly stating that N being at least two and N being no more than fifty. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have N be at least two and N being no more than fifty, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

As per claims 18-19, Yin [6,844,550] teaches processing in parallel comprises comparison of the collected data from each area with another set of data, and the

comparison comprises alignment, differencing, filtering, and defect location. See Yin [6,844,550] col. 3 lines 1-25, 1-45.

As per claims 21,22, Yin [6,844,550] teaches a first processor system for processing data from the first detector to inspect for defects, and a second processor system for processing data from the second detector to inspect for defects, and a translation system for translating the wafer under the first and second incident beams such that the first and second regions being scanned across the wafer. See Yin [6,844,550] col. 2 line 65 – col. 3 line 25, fig. 3, and col. 6 lines 35-67.

As per claim 23, Yin [6,844,550] teaches the first and second incident beams each comprising incident electrons, and wherein the first and second columns each comprising an objective lens and a beam separator device. See Yin [6,844,550] fig. 11, col. 3 lines 1-25, col. 13 lines 1-15.

As per claim 27, Yin [6,844,550] teaches the electrons emitted from the first and second regions comprising secondary electrons. See Yin [6,844,550] fig. 11, col. 3 lines 1-25, col. 13 lines 1-15.

Claims 1-5,9,11-15,18-23,27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakoshi [6,476,390] in view of the "Multiple Electron-Beam Lithography" by Chang et el. As per claims 1-5,9,15,20 Murakoshi [6,476,390] teaches a method/apparatus of inspecting a portion of a substrate, the method comprising generating electron beams from multiple electron beam columns, directing the electron beams through N beam separators in a first direction, focusing the incident electron beams onto N areas of the substrate, directing electrons emitted from the N areas

through the N beam separators (8a-8b) in a second direction so as to separate the emitted electrons from the incident beams, detecting the emitted electrons in parallel manner and translation of the substrate in a path that covers approximately 1/N of the portion of the substrate to be inspected. See Murakoshi [6,476,390] abstract, figs. 1,6, col. 2 lines 1-10,25-67, columns 3-4,6-7, col. 8 lines 30-67, col. 9 lines 1-36, col. 10 lines 1-50, and col. 11 lines 27-36. However, Murakoshi [6,476,390] does not explicitly state the beams being multi-pixel beams. The "Multiple Electron-Beam Lithography" by Chang et el, does teach the beams being multi-pixel beams. See The "Multiple Electron-Beam Lithography" by Chang et el, abstract, first and second paragraphs on page 1, paragraph 2-3,5 on page 3 and paragraphs 1-3 on page 4. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have incident beam from the multiple columns be multi-pixel beams in order to allow the detection of smaller sized defects, and reduce the time need to inspect a substrate for defects.

As per claims 5,11-12 Murakoshi [6,476,390] teaches a translation mechanism for translating the wafer under the plurality of incident beams such that the corresponding regions are scanned across the wafer. See Murakoshi [6,476,390] col.7 lines 25-35.

As per claims 13-14, Murakoshi [6,476,390] teaches N being at least two and no more than fifty. See Murakoshi [6,476,390] fig. 1.

As per claims 18-19, Murakoshi [6,476,390] teaches processing in parallel comprises comparison of the collected data from each area with another set of data,

and wherein the comparison comprises alignment, differencing, filtering, and defect location. See Murakoshi [6,476,390] col. 6 lines 5-55.

As per claim 21, Murakoshi [6,476,390] teaches a first processor system for processing data from the first detector to inspect for defects, and a second processor system for processing data from the second detector to inspect for defects. See Murakoshi [6,476,390] fig. 1.

As per claims 22-23, 27, Murakoshi [6,476,390] teaches a translation system for translating the wafer under the first and second incident beams such that the first and second multiple pixel regions are scanned across the wafer, wherein the first and second incident beams comprise incident electrons, and wherein the first and second columns each comprise an objective lens, and wherein the electrons emitted from the first and second regions comprise secondary electrons. See Murakoshi [6,476,390] fig. 1, col. 6 lines 5-60, col. 8 lines 60-67, and col. 9 lines 1-20.

Response to Arguments

Applicant's arguments filed 8/8/05 have been fully considered but they are not persuasive. With regards to applicants' arguments concerning there not being a separator for separating the incident beam from the beam of secondary electrons, it is the examiner's view that Yin [6,844,550] clearly teaches this. See Yin [6,844,550] fig. 11, col. 13 lines 5-15. Here Yin [6,844,550] clearly teaches the use of a Wein filter. It is notoriously well known in the art to use Wein filters for separating primary/incident electron beams from backscattered secondary or reflected secondary electron beams.

In addition, Yin [6,844,550] teaches that each of the multi-columns should have the same equipment (meaning they should be constructed identically to one another). Therefore each multi-column would have a Wein filter for separating the incident beam from the backscattered beam.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Quash whose telephone number is (571)-272-2480. The examiner can normally be reached on Monday thru Friday 9 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571)-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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a,2
2/2/06

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